AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Previously Presented)** A laser module for optical transmission systems, comprising:

a laser diode emitting light at an emitted output wavelength;

an optical resonator connected to said laser diode and having a reflective mirror surface and an adjustable effective optical path length and a photon density as a function of the effective optical path length;

an optical waveguide having a Bragg grating receiving the light from said laser diode; and

a stabilizer stabilizing the emitted output wavelength and having:

a measurement apparatus for measuring the photon density within said resonator,

an adjustment apparatus for adjusting the effective optical path length of said resonator, and

a control apparatus comparing the photon density at different effective optical path lengths of said resonator and producing control commands to said adjustment apparatus in order to adjust the effective optical path length of said resonator to equal the emitted output wavelength to a desired wavelength, wherein said control apparatus is part of a control loop regulating the emitted output wavelength of the laser module at the desired wavelength, with the photon density being measured iteratively and said control apparatus emitting a control command to said adjustment apparatus for adjusting the effective optical path length of said resonator based on a difference between two successive measurements, the amount of adjustment of the effective optical length being proportional to the amount of difference between the two successive measurements; and

coupling optics coupling said laser diode to said Bragg grating, said coupling optics being a lens selected from the group consisting of a silicon lens, a spherical lens, an aspherical lens, and a graded index lens composed of a suitable optical material, said lens being disposed between said laser diode and said optical waveguide and being spacially separated from said optical waveguide, wherein said coupling optics are slightly inclined from a normal of the axis of the optical waveguide.

2. **(Original)** The laser module according to claim 1, wherein said reflective mirror surface of said optical resonator is highly reflective.

3. **(Original)** The laser module according to claim 1, wherein said adjustment apparatus has a device for longitudinal movement of said optical waveguide.

4. **(Original)** The laser module according to claim 1, wherein said adjustment apparatus has a thermal regulating device for said laser diode.

5. **(Original)** The laser module according to claim 4, wherein said thermal regulating device heats said laser diode.

6. **(Original)** The laser module according to claim 4, wherein said thermal regulating device cools said laser diode.

7. **(Original)** The laser module according to claim 1, wherein said adjustment apparatus has a device for varying an operating current of said laser diode.

8. **(Original)** The laser module according to claim 1, wherein said measurement apparatus has a monitor diode disposed adjacent said highly reflective mirror surface of said optical resonator and detecting light output from said resonator by said mirror surface.

9. **(Original)** The laser module according to claim 1, wherein said measurement apparatus has a detector for detecting a voltage across said laser diode when a laser operating current is constant.

10. **(Cancelled)**

11. **(Original)** The laser module according to claim 1, wherein said laser diode forms a Fabry-Perot semiconductor laser having a facet formed by said highly reflective mirror surface of said optical resonator.

12. **(Original)** The laser module according to claim 11, wherein said Fabry-Perot semiconductor laser has a front facet coated with an antireflective coating, said Fabry-Perot semiconductor laser sending light from said antireflective coating to said Bragg grating.

13. **(Original)** The laser module according to claim 1, wherein:

said Bragg grating has a central wavelength; and

said control apparatus controls said adjustment apparatus to approach the emitted output wavelength to the central wavelength of said Bragg grating.

14. **(Original)** The laser module according to claim 1, wherein:

said Bragg grating has a central wavelength; and

said control apparatus controls said adjustment apparatus to equal the emitted output wavelength to the central wavelength of said Bragg grating.

15. – 16. **(Cancelled)**

17. **(Previously Presented)** The laser module according to claim 1, wherein said coupling optics have an antireflection coating.

18. **(Canceled)**

19. **(Original)** The laser module according to claim 1, wherein said optical waveguide is a single-mode glass fiber.

20. **(Original)** The laser module according to claim 19, wherein:
said glass fiber has an end; and
said end of said glass fiber has an antireflection coating.

21. **(Previously Presented)** The laser module according to claim 19, wherein:
said glass fiber has an end; and
said end of said glass fiber is slightly inclined from a normal to the axis of the glass fiber.

22. **(Original)** The laser module according to claim 1, wherein said Bragg grating is immediately adjacent said laser diode.

23. **(Original)** The laser module according to claim 1, wherein said control apparatus emits a control command to said adjustment apparatus to change the effective optical path length of said resonator by a predetermined fixed amount.

24. **(Cancelled)**

25. **(Previously Presented)** A method for stabilizing an output wavelength of a laser module for optical transmission systems, which comprises:

a) providing a laser module including a laser diode emitting light at an emitted output wavelength, an optical resonator connected to the laser diode and having a reflective mirror surface and an adjustable effective optical path length and a photon density as a function of the effective optical path length, an optical waveguide having a Bragg grating receiving the light from the laser diode, and coupling optics coupling the laser diode to the Bragg grating, the coupling optics being a lens selected from the group consisting of a silicon lens, a spherical lens, an aspherical lens, and a graded index lens composed of a suitable optical material, the lens being disposed between the laser diode and the optical waveguide and being spacially separated from the optical waveguide, and transmitting light in the resonator between the laser diode and the Bragg grating via the optical waveguide;

b) measuring the photon density within the resonator at a first effective optical path length of the resonator;

c) changing the effective optical path length of the resonator;

d) measuring the photon density within the resonator at a second effective optical path length of the resonator;

e) comparing the two measured photon densities;

f) adjusting the effective optical path length of the resonator based on the comparing step, with the effective optical path length of the resonator being changed depending on the comparing step;

g) repeating steps b) to f) until the emitted output wavelength is equal to a desired wavelength; and

repeating steps b) to g) regularly throughout a life of the laser module to calibrate the output wavelength

26. **(Cancelled)**

27. **(Original)** The method according to claim 25, which further comprises repeating steps b) to e) until the emitted output wavelength equals a central wavelength of the Bragg grating.

28. **(Original)** The method according to claim 25, wherein the measuring of the photon density utilizes a monitor diode.

29. **(Original)** The method according to claim 25, wherein the measuring of the photon density utilizes a voltage dropped across the laser diode when a laser operating current is constant.

30. **(Previously Presented)** The method according to claim 25, wherein the effective optical path length of the resonator is adjusted by at least one of externally changing a temperature of the laser diode, varying an operating current of the laser diode and axially moving the optical waveguide.

31. **(Original)** The method according to claim 25, wherein the comparison of the measured photon densities is carried out by subtraction in step e) .

32. **(Original)** The method according to claim 25, wherein the effective optical path length of the resonator is always changed by a predetermined value in step f).

33. – 34. **(Cancelled)**

35. **(Previously Presented)** The method according to claim 25, wherein the effective optical path of the resonator is adjusted based on a difference between the two measured photon densities, the amount of adjustment of the effective optical length being proportional to the amount of difference between the two measured photon densities.

36. **(New)** The method according to claim 1, wherein the coupling optics includes an aspherical lens.

37. **(New)** The method according to claim 1, wherein the coupling optics includes a graded index lens.

38. **(New)** The method according to claim 1, wherein a front facet of the laser diode includes a tilt angle with respect to a laser axis.